

1889. *Schwarz, E. A.* — Myrmecophilous Coleoptera found in Temperate North America. Proc. Ent. Soc. Washington, I, 1889, pp. 237-247.
1869. *Scudder, S. H.* — Entomological Correspondence of Thaddeus William Harris. Occas. Pap. Bost. Soc. Nat. Hist., I, 1869, 375 pp., 4 pls.
1891. *Scudder, S. H.* — Some Old Correspondence between Harris, Say and Pickering. Psyche, VI, 1891, pp. 57-60, 121-124, 137-141, 169-172, 185-187.
1894. *Wasmann, E.* — Kritisches Verzeichnis der myrmekophilen und termitophilen Arthropoden. Berlin, Dames, 1894, xiii + 231 pp.
1900. *Wasmann, E.* — Zur Kenntniss der termitophilen und myrmekophilen Cetoniden Südafrikas. Illustr. Zeitschr. f. Ent., V, 1900, pp. 65-84, 1 pl.

NEW SPECIES OF NOCTUIDÆ FOR 1908. I.
WITH NOTES ON CHARADRA, RAPHIA
AND PSEUDANARTA.

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CHARADRA Wik.

There are now five species in our fauna which seem properly referable to this genus, and these may be distinguished as follows:

Secondaries white or whitish, more or less infuscated outwardly.

Primaries with median lines connected by a more or less obvious line; t. a. line with an outward dentation at its middle.

Orbicular conspicuously black centered.

Primaries smooth, even dark gray, without strong contrasts; secondaries almost uniformly white.....*ingenua*.

Primaries whitish, black powdered, contrastingly marked; secondaries a little stained, especially in female, and outwardly darker.

deridens.

Orbicular not conspicuously black centered; maculation not strongly contrasting, secondaries of ♀ dusky throughout.....*sudena*.

Primaries with median lines not connected; t. a. line upright, without an outward dentation at middle.....*dispulsa*.

Secondaries yellow at base, with a determinate outer black marginal band.....*patens*.

Ingenua Sm., is the largest of these species and is from Colorado. The smooth, even, glistening gray primaries distinguish it readily, and the black markings are not conspicuously contrasting.

Deridens Gn., is the common species, ranging from Canada to Florida and west to the Mississippi. The ground color of the primaries is white with a slight creamy tinge and on this the markings are laid in black or bluish powderings, sometimes covering the wing very completely; but always leaving a considerable portion of the ground color exposed in contrast. The lines of maculation are usually intensely black, and the round black orbicular is usually one of the conspicuous features of the wing; but it is rarely brown rather than black, especially in old or worn examples. The connection between the ordinary lines is always obvious and usually conspicuous and the upper part of the median shade joins this connection, giving the effect of a frame with light filling, centered by the orbicular.

Sudena Sm., is a dull, smaller reproduction of *deridens* and may not really be specifically distinct. It is from Miami, Florida, and as a whole is less contrastingly marked than the preceding, the darker portions more like washings than powderings. The orbicular is hardly darker than ground and the lines are narrow and scarcely contrasting.

Dispulsa Morr., is chiefly from Texas and is a very light ashen gray species with rather scattering blackish powderings. The lines are narrow, black, and there is no longitudinal connection between them.

Trisuloides patens Druce, is a *Charadra* which I had named *basiflava* before Dr. Barnes called my attention to the figure in the *Biologia* (II, 509, pl. 96). It has been taken at Palmerlee, Cochise Co., Arizona, and is no doubt a member of our fauna.

Decora Morr., and *illudens* Wlk., are hardly congeneric with the preceding.

Charadra sudena, new species.

In all essential details of maculation like *deridens* Gn. It differs in its smaller size in both sexes, in the narrower, much less contrasting transverse lines and it lacks the conspicuous black center to the orbicular. The bar connecting the median lines is narrow, brown or altogether wanting, and the s. t. line is much less irregular.

Expands, 1.36-1.44 inches = 34-36 mm.

Habitat. — Miami, Florida.

Two males and one female from Dr. Barnes; all of them a little discolored, but otherwise in good condition.

RAPHIA Hbn.

In 1903 I separated out the species of this genus with material then in hand, and concluded that *R. coloradensis* and *R. pallula* represented good species, and that another which I named *cinderella* was rightfully entitled to a name. Recently, in looking over Dr. Barnes' magnificent collection he called my attention to a series of six examples of yet another form, differing from all the others. His material bears out fully my conclusions of 1903, and he was good enough to let me have a series of his examples so that now I have before me sufficient material to demonstrate the differences sharply. As they stand now in the collection their distinctness is so obvious that I have no hesitation in expressing my confidence in their validity. Curiously enough four of the species occur at Denver, and they show a much closer relationship between *coloradensis* and *abrupta* than between the former and *frater*, with which it has been usually associated. In fact *frater* varies scarcely at all, specimens from all parts of its range being practically alike.

In tabular form I make the separation as follows :

Secondaries smoky in both sexes.....	<i>abrupta</i> .
Secondaries white in both sexes.	
Ordinary spots large, completely outlined ; reniform approximately kidney-shaped.	
Primaries uniformly very dark gray, wings not blotched, maculation not contrasting.....	<i>frater</i> .
Primaries powdery gray over a white base, more or less tinged or blotched with luteous ; inferior half of basal space blacked powdered.	<i>coloradensis</i> .
Ordinary spots greatly reduced and not completely outlined ; reniform either reduced to an upright dusky filling or, if marked, then narrow, upright, not kidney-shaped.	
Very even pale gray, coarsely powdered, veins conspicuously blackish, giving a rayed appearance ; s. t. line scarcely traceable.....	<i>elbea</i> .
Blotched with luteous, less evenly powdered ; reniform reduced to an upright dusky shade which is sometimes divided into two black spots.	<i>pallula</i> .
Very even, pale ash gray ; veins not blackish ; s. t. line distinct ; reniform dusky.....	<i>cinderella</i> .

Abrupta Grt., differs from all species in the infuscated secondaries, and when there is a series under examination the species stands out very clearly. The primaries are rather uniform dull ashen gray, not so roughly powdered as some of the other species, and while all the maculation is well written it is not conspicuous nor contrasting. It seems

to be the least common of the species, albeit widely distributed, the specimens before me coming from Illinois, Colorado and Texas. It has been also recorded from Canada and thus has a range that will probably carry it to the Rocky Mountain chain.

Frater Grt., is the most common of the species. It is also the darkest in color and always recognizable by the contrast between the very dark steel gray primaries and the white secondaries. The maculation is in black, and the lines are as a rule clearly written. There is more or less black powdering and in some specimens a tendency to darken the lower half of the median space. In the material before me are specimens from Ontario, Winnipeg, Cartwright, Manitoba, Aweme, British Columbia, Connecticut, New Jersey, New Hampshire, Illinois, Iowa and Colorado. Texas has been included in the record, so that this is probably the most widespread as well as the most abundant of our species.

Coloradensis Cram., is nearer like *abrupta* than like *frater* in maculation, but has white secondaries, while the primaries are more or less blotched with yellow and powdered with black. There is a distinct tendency to darken the lower half of the median space, and some examples are very contrastingly marked. All my examples are from Colorado; Denver and Fort Collins being the specific localities represented.

Elbea Sm., is a very characteristic species which, because of the black powdering along the veins and the reduction of the transverse lines, has a peculiar rayed or strigate appearance. The ordinary spots are much reduced and the reniform is narrow, upright and scarcely defined. All the examples are from Deming, New Mexico.

Pallula Hy. Edw., looks, at first sight, like an intensified *coloradensis*, but it is still more blotchy, more coarsely and irregularly powdered, while the reniform is not outlined at all and only the dark filling remains. Even this is reduced in some specimens so that only a little black powdering remains to indicate the inferior angle, while in other cases two black spots mark its upper as well as lower portions. Denver, Colorado, and Phoenix, Arizona, are the localities represented in my collection.

Cinderella Sm., is a dull powdery gray form, but very pale, very even and the powderings not black nor contrasting. The ordinary lines are not well marked and while almost everything is present, there are no really black markings at all. The s. t. line is really the

most conspicuous feature of the wing, in contrast to the other species where the opposite is rather the rule. My specimens are from Los Angeles.

Raphia elbea, new species.

Ground color whitish, with an irregularly disposed mottling of luteous and with coarse blackish powderings giving it an ash-gray appearance. Head yellow in front, vertex blackish. Collar black lined and black tipped. Patagia yellowish, powdery, with a dark gray submarginal line. Disc of thorax gray, powdery, posteriorly tipped with blackish. Abdomen gray, powdery, the tufts black mottled. Primaries with all the maculation obscured by the coarse powderings, no two examples being alike in the amount of powderings or yellow mottling. Basal line sometimes indicated by black costal spots. T. a. line geminate, sometimes complete, sometimes upper half only distinct, sometimes nearly all lost; usually the outer part of line best marked and black; in course it is outcurved with a little outward tooth at middle into the claviform. T. p. line single, linear, shaped as in its allies, sometimes followed by pale scales giving an obscurely geminate appearance. S. t. line altogether wanting or present as a diffuse irregular pale shading through the darker exterior area. A series of distinct black terminal lunules between the black marked veins, this blackish marking sufficiently conspicuous to give the wings a somewhat strigate appearance. There is a dusky blotch on costa, indicating the inception of a median shade, and below the claviform is a dark cloud across the median space. Orbicular small, round, outlined in gray, yellowish. Reniform scarcely defined, upright, narrow, yellowish, with exterior border more or less black powdered. Claviform large, extending as usual across the median space and more or less yellowish tinted. Secondaries white, with scant black powderings outwardly, grouped into a diffuse, vague blotch at the anal angle, and a series of very distinct black interspaceal terminal lunules. Beneath white, more or less black powdered; with a small discal lunule on all wings and, in some specimens, an indicated common outer line.

Expands, ♂ 1.20-1.28 inches = 30-32 mm.: ♀ 1.40-1.48 inches = 35-37 mm.

Habitat. — Deming, New Mexico, July 8-15.

Three males and three females, all in good condition, from Dr. Barnes. The males are uniformly and decidedly smaller in this series of specimens; but that may not be universally true. As a rule, however, the males throughout this genus average smaller than the females.

Acronycta tonitra, new species.

Head, thorax and abdomen a soft smoky gray. Orbits of the eyes white, breast whitish, legs more or less smoky gray. Primaries soft smoky gray, a white shade preceding the t. p. line and extending inward into the median space more or less. T. a. line outwardly oblique, very obscure, sometimes barely traceable, marked by an oblique costal shade, usually also by a little V-shaped mark below the cell, from which a line of black scales may be traced to the base; a few white scales sometimes indicate the course of the line. T. p. line well removed outwardly, nearly parallel with outer margin, strongly dentate in the interspaces, more or less marked with black scales and preceded by a white shade which may be obscure or well-marked, linear,

or inwardly diffuse so as to lighten a part of the median space. The fringes are paler gray, outwardly tipped with white and narrowly cut with gray on the veins. Orbicular small, oval, concolorous, more or less obviously outlined in black. Reniform oval, obscure, more or less darkened by a blackish median shade which extends obliquely from the costa to the reniform and is rarely traceable below that point. Secondaries very pale smoky gray, tending to whitish. Beneath smoky gray, varying in tint, with a dusky discal spot on all wings and an indicated common extra-median line.

Expands 1.40-1.64 inches = 35-41 mm.

Habitat. — St. Louis, Missouri, June 9, July 21, August 12, 21, 23, Mr. H. McElhose.

Altogether unlike any other of our species by the soft smoky color and the strongly denticulated outer line. From the single female in my collection I had taken it to be *similana* of which I had only males from Chicago. Mr. A. Kwiat, however, who had both sexes of *similana* received also both sexes of the St. Louis species from Mr. McElhose, demonstrating their specific difference at once. *Similana* as appears now, from better material, is more ashen gray, powdery, although the lines are much the same in course. Above the anal angle the black line is more distinct in *tonitru* and traceable across the t. p. line. Two males and five females are under examination as co-types. One pair in my collection, the others with Messrs. Kwiat and McElhose, the specific name being a suggestion from Mr. Kwiat.

Noctua bairdii, new species.

Pale gray, a little lustrous. Head concolorous. Collar, basal one third black, contrasting. Thorax powdered with black atoms. Abdomen more yellowish, dull, not lustrous. Primaries powdered with blackish atoms which are somewhat more dense outwardly and toward the inner margin. Basal line single, broken, blackish, a little diffuse. T. a. line incomplete, marked by a blackish spot on costa and traceable as a diffuse, broken band to the sub-median interspace. T. p. line marked by a black spot on costa, then continued as a brown, thick, denticulated line which is not much relieved against the light ground: in course it bends widely from costa over reniform and is almost evenly oblique below that point. There is a vague dusky median shade, well marked on the costal area; but lost beyond the cell. S. t. line a diffuse brownish shade parallel with the outer margin, and hardly traceable below the middle of the wing. There is a pale line at the base of the fringes. Orbicular vaguely traceable as a moderate round spot. Reniform narrow, lunate, the sides marked by black scales. Secondaries whitish with a slight yellowish tinge, costal region apex and outer margin darker, fringes white. Beneath whitish, primaries with a smoky suffusion, both wings with a punctiform extra-median line.

Expands, 1.72 inches = 43 mm.

Habitat. — High River, Alberta, Canada.

One female example in fair condition received from Mr. Baird who collected it and after whom I have named it, through Dr. Fletcher.

There is no very near ally to this species. It belongs obviously to the *lubricans* series and stands next to *atricincta*, than which it is much larger, quite different in ground color and without the obvious transverse lines. So far as they go, however, the lines in *bairdii* correspond in position with those of *atricincta*. As I understand it, only the one example was taken.

Aplectoides abbea, new species.

Ground color whitish, more or less overlaid by mossy green and shaded with blackish brown or gray. Head whitish, overlaid with green, sometimes slightly reddish. Collar similar in color to the tip, which is edged with blackish at the base of the small, blackish marked, anterior tuft. Thorax gray with greenish overlay, patagia with black submargins; a black line at base of basal tuft. Abdomen whitish. Primaries varying in shade and amount of green overlay, all the markings distinct. Basal line geminate, black, white filled, extending to a small black basal line. T. a. line geminate, black, outer portion best defined, included space more or less white; on the whole outwardly oblique, deeply incurved on the cell to avoid the larger, irregularly ovate orbicular which is black ringed, the black inwardly edged with white scales, concolorous or paler. Claviform moderate or small, narrow, outlined in black, concolorous. Reniform large, kidney-shaped, varying somewhat in width, black ringed, narrowly annulate with white, inferiorly a little dusky. A black bar connects the ordinary spots inferiorly. T. p. line geminate, inner line more distinct, black, lunulate, outer even, not so well marked, included space paler than ground; outwardly bent from costa over cell, then very even, almost parallel with outer margin. S. t. line sinuate, of the ground color, preceded by a darker shading which tends to form black sagittate marks in the interspaces, just below costa and opposite the cell. A series of black interspaceal terminal lunules. Secondaries dirty white with a faint yellowish tinge; a discal lunule, an extra-median line and a subterminal shade band being obscurely indicated. There is a broken, brown, terminal line. Beneath whitish, more or less powdery outwardly and along the costal margins; all wings with an extra-median dusky shade line and a smoky discal spot.

Expands, 1.60-1.72 inches = 40-43 mm.

Habitat.—Westminster, B. C.

Three females in good condition from Dr. Barnes. The species is intermediate between the eastern *pressa* and *prasina* in size and, while at first sight it resembles a small *prasina*, the details of the maculation are much nearer to those of *pressa*, which it does not greatly resemble. I have associated it generically with *pressa* rather than *prasina*; but it is quite probable that eventually all the forms must be placed together in one generic group.

Chorizagrotis boretha, new species.

Ground color dull smoky red-brown. Head concolorous or a little paler. Collar inferiorly pale, like the costal region of primaries; this pale portion limited above by a transverse black line. Thorax of the ground color, disc tending to become a little paler; primaries with costal region more or less contrastingly paler, tending to yellowish; ordinary spots also discolored, yellowish. Cell black-filled before and between the macula; a black mark below median vein in basal space. Basal line geminate, black, marked on costa and where it cuts the basal streak with its pale filling. T. a. line geminate, black, with pale included space, incomplete, marked on costa and by an excurved mark in the sub-median interspace. T. p. line geminate, the outer portion tending to become lost, the inner lunulate, abruptly bent outward below costa, then almost parallel with outer margin. S. t. line a little sinuate, of the ground color, marked by the darker color of terminal space except at apex where it is defined by a dusky preceding shade; also preceded by a series of sagittate black marks in the interspaces. A series of small black terminal lunules and a yellow line at base of fringes. Claviform moderate in size, concolorous, pointed, black margined. Orbicular moderate in size, a little oblique, tending to ovate, yellowish, contrasting. Reniform large, kidney-shaped, incompletely black margined, yellow with a smoky central line, top and bottom tending to become infuscated. Secondaries smoky whitish at base, becoming darker outwardly; a smoky discal lunule; fringes whitish. Beneath whitish, more or less powdery, all wings with a discal spot, primaries with an indicated outer line.

Expands, 1.40-1.48 inches = 35-37 mm.

Habitat.—Kaslo, B. C., August and September, Mr. Cockle.

Three males and one female, none of them very good, but altogether demonstrating a distinct species allied to *terrealis* Grote. From the latter species the discolorous ordinary spots separate it at once, the general details of maculation being otherwise much the same. The single female is much more powdery in appearance than any of the males, but this may not be a uniform feature. In a general way the species has the appearance of *perexcellens*, the antennal structure, however, being quite different.

Chorizagrotis sordida, new species.

Ground color dull sordid brown, more or less shaded with black or smoky. Head concolorous. Collar concolorous, with a black median line. Thorax uniform, of the ground color. Primaries with a black diffuse streak through basal space below median vein, interrupted by the basal transverse line. Cell more or less darker or even blackish before and between the ordinary spots, but not solid black-filled. Basal line geminate, black, included space pale, usually broken and best marked on costa and through the black streak. T. a. line geminate, black, included space pale, a little outwardly oblique and slightly excurved in the interspaces. T. p. line geminate, the outer portion lost beyond the costal region, the inner blackish, lunulate, very even, almost parallel with outer margin. S. t. line a little sinuate, concolorous, marked by a dusky preceding shade on the costa and by a series of black, sagittate interspaceal

marks; below the apex also by a slight darkening of the terminal space. There is a pale line at the base of the fringes. Claviform narrow, pointed, extending almost to the middle of the median space. Orbicular small, round, or ovate, ringed with yellowish. Reniform large, kidney-shaped, edged with black and usually incomplete above and below; with an inner ring of yellow scales and the center of the spot more or less yellowish and discolored. Secondaries dull yellowish white at base, darkening to a broad smoky border, fringes white. Beneath whitish, powdery, all wings with a discal spot, primaries with disc more or less smoky and sometimes with an indicated outer line.

Expands, 1.44-1.56 inches = 36-39 mm.

Habitat. — Kaslo, B. C., September 6, Mr. Cockle.

1 ♂ and 5 ♀, in fair or good condition. This is a peculiarly sordid looking form with the depressed body of the majority of the species, but the maculation more like that of some of the species of *Euxoa* of the *ochrogaster* series. It differs from *boretha* in the flattened appearance and in the concolorous orbicular, costa and collar. It varies in the amount of blackish overlay in the median space, one example being almost purplish black.

Porosagrotis delorata, new species.

Ground color dull luteous gray, with a greenish tinge. Head with a black line between the antennæ. Collar black powdered, with a black transverse line. Thorax black powdered, the patagia not well marked in the specimen. Primaries with all the maculation well defined, none of it conspicuously contrasting. Basal line geminate, blackish, almost upright, extending into the sub-median interspace. T. a. line upright from costa to vein one, then with a long outward bend to the inner margin; geminate, outer portion black, inner brown, included space a little paler than the ground. T. p. line geminate, inner portion lunulate, blackish, outer even, less marked, included space a little paler; in course with a slight, very even outcurve over cell, and an even less obvious incurve below. S. t. line pale, a little irregular, with distinct outward dentations on veins 3 and 4, preceded by black, more or less sagittate marks. There is a series of black terminal lunules. The surface of the wing is very finely black powdered, and where this powdering is absent as on the veins and between the median lines, the appearance is as of a paler marking. The claviform is broad, extends almost to the middle of the cell and is filled with blackish powderings. It does not extend basad of the t. a. line and is not in any way connected with the base. The cell is a little more densely powdered before and between the ordinary spots. Orbicular large, nearly round, concolorous, with a pale annulus. Reniform large, incompletely defined, extends a little beyond the borders of the cell, blotched with blackish. The terminal space is a little darker than the remainder of the wing. Secondaries smoky at base, blackish outwardly, fringes whitish. Beneath whitish, lustrous, disc of primaries darker.

Expands, 1.46 inches = 36 mm.

Habitat. — High River, Alberta, Canada.

A single good male collected by Mr. Baird and sent in by Dr. Fletcher. The specimen has moderately pectinated antennæ and the branches are bristle-tufted at the tips. It is related in general type of maculation to *orthogonia* Morr., but differs in the darker ground color of the primaries in which the greenish tint is obvious, and in the smoky secondaries, which in *orthogonia* are almost white in the male. It is unfortunate that the female is not at hand; but only the single example was taken.

PSEUDANARTA Grt.

In looking over his collection, Dr. Barnes also called my attention to the species of *Pseudanarta* which, in his opinion, were getting mixed — *i. e.*, specimens were being referred under names which did not really cover them. He was good enough also to turn over some of this incongruous material to me and this I have combined and closely compared with my own.

There are five nominal species in our catalogues: *aurea* Grt., *flava* Grt., *singula* Grt., *flavidens* Grt., and *falcata* Neum., and of these, *flava* is the generic type. I called attention to the fact that *aurea* was not congeneric with the other species, in 1892, after examining the type in the British Museum, and it is probable that this species is the type of *Copanarta* Grt., Abh. nat. Ver. Brem., XIV, 112, cited as a synonym of *Pseudanarta* by Dyar; but I do not have the publication for reference. Later, when describing *Oncocnemis nigerrima* in the Journ. N. Y. Ent. Soc., 1903, I referred to it as a close ally of *aurea* Grt., which I placed in the same genus; whether wisely or not is perhaps a question. At all events *aurea* with its abbreviated, armed fore-tibia cannot remain associated with *flava*, which has the same member long, slender and unarmed.

P. falcata Neum. differs from all the other members of the genus in wing form and in the divergent more hairy thoracic vestiture, and its stay in this genus will probably be limited.

This leaves three species, all described by Mr. Grote, and fully congeneric. *Flava*, the first described and also the smallest has an ash-gray base upon which the maculation is somewhat inconspicuously marked. There is a distinct connecting bar between the median lines and above that the median space is more or less brownish, a color that is also evident in the s. t. space. The t. p. line is exerted over the cell and has the angles of the exertion a little marked, sometimes emphasized when the line is a little drawn in just opposite

the middle of the cell. *Crocea* Hy. Edw. was referred to by Mr. Grote as barely a variety of his species, but Hampson recently recognized it as distinct.

Singula is larger and darker with the maculation much better defined and black; the black bar connecting the median lines is conspicuous, but there is no brown shading above it. The course of the t. p. line is much as in *flava*, except that the angle of the lower part of the exsertion is much more obvious, and an oblique shade composed of short black dashes extends through the s. t. space almost to the apex. The color of the secondaries is also deeper, more orange than yellow and, altogether, this is a very good species.

Flavidens differs obviously from both the preceding by the very even t. p. line which is roundedly exserted over the cell and very deeply incurved below it, so that it narrows the median space which is not crossed longitudinally by a conspicuous bar; but it is crossed transversely by a conspicuous black shade which passes between the ordinary spots, and below the cell is close to or in actual contact with the t. p. line.

Out of the material separated from the specimens that agree fully with the described species I have separated three series, two representing forms that seem to be undescribed and these are here characterized as follows, while I have re-characterized *crocea* Hy. Edw., which is really a very good species and not a variety or synonym.

***Pseudanarta dupla*, new species.**

Ground color dark chocolate brown. Head and thorax with gray scales intermixed, giving a somewhat hoary appearance which tips the collar and the edges of the patagia; the latter with a submarginal blackish line. Basal line geminate, black, traceable almost all the way across the wing. T. a. line geminate, outer portion black, inner obscure, intervening space white powdered; in course outwardly oblique, with an outward angle on the sub costa, a more prominent one in the sub-median interspace, and a smaller, more acute tooth below the sub-median. T. p. line geminate, inner line black, distinct, outer brown, obscure, included space white; in course squarely exserted over the reniform, forming a distinct angle on vein 5, thence very evenly oblique to the hind margin except where it is a little drawn in to meet the black bar which extends through the median space from the middle angulation of the t. a. line. The median space above the bar is more obviously brown than elsewhere in the wing. Orbicular large, oblique, concolorous, narrowly outlined by white scales. Reniform large, kidney-shaped, slightly darker, narrowly outlined by white scales. S. t. line whitish, a little irregular, outwardly edged by black scales in the dusky terminal space; as a whole almost parallel in course with the t. p. line, so that the s. t. space which is paler than the rest of the wing, is remarkably uniform in width throughout. The fringes are broad, brown at base, paler

outwardly, cut with pale beyond the veins. Secondaries pale orange with a broad, black, sharply defined black outer margin, the inner edge of which is a little drawn in opposite the cell and in the sub-median interspace, while it forms an outward dent on vein 1. Beneath, both wings yellow with a broad blackish outer border. The primaries are much powdered with blackish, have no discal spot and the outer black border is limited inwardly by a transverse line. The secondaries have a small black discal spot and the black border is a duplicate of that of the upper side.

Expands, .94 inch = 23-24 mm.

Habitat.— Stockton, Utah, September 18; South Park, Colorado.

Two males in fair condition; the Utah example from Mr. Tom Spalding, the other from Mr. David Bruce. The latter has passed as *flava* in my collection for nearly twenty years and yet it is really nearer to *singula*. Its more striking superficial characters are the very even, pale s. t. space and the uneven black border of the secondaries, which are not found in any other species. On the under side the primaries have no discal spot while that in *flava* is conspicuous; *flavidens* has none, but on the upper side *flavidens* has the terminal space concolorous while in *dupla* it is distinctly darker.

Although found at widely different localities and fully fifteen years apart in time, the two examples before me are almost identical.

Pseudanarata crocea Hy. Edw.

Ground color gray. Head a little darker, uniform. Thorax ashen gray, with an intermingling of darker scales; no distinct markings. Primaries without any brown shading, all the maculation black and gray. Basal line geminate, black with a wide outward angle in the cell. T. a. line geminate, black, included space whitish powdered, widely outcurved as a whole, with moderate outcurves in the interspaces. T. p. line geminate, inner line black, lunulate, outer brown, even, included space white, evenly outcurved over cell, without angles, only a little incurved below. S. t. line irregularly sinuate, preceded by a series of black marks in the s. t. space and followed by a more or less well marked black shading. There is a crenulate white terminal line and the long fringes are cut with pale on the veins. The s. t. space except where the blackish spots mark the s. t. line is powdered with gray and this extends almost to the apex. Orbicular narrow, oblong, very oblique, white ringed and obscurely pale powdered. Reniform large, kidney-shaped whitish marked. Both spots somewhat confused by a gray shade which lightens the upper part of the median space and appears like a gray blotch. There is a slightly darker shade, but no obvious cross bar between median lines. Secondaries pale orange with a broad, black marginal band, the inner edge of which is sharply defined and very even. Beneath, both wings yellow at base and with a broad outer black marginal band; neither with a discal spot; primaries much paler than secondaries.

Expands, .92-.96 inch = 23-24 mm.

Habitat.— Colorado: Salida in July, Durango, Glenwood Springs in September; Utah: Stockton in September; Arizona: Yavapai County in September.

Four males and three females; of these the Arizona ♀ is from Mr. Otto Buchholz; the Utah female is from Mr. Tom Spalding; one Salida male is of my own capture; the others are from Dr. Barnes.

This species differs from all the others in the absence of discal spots on the underside, in the very sharply defined edges to the black border and in fact that on primaries the margin of the border is oblique from costa to inner margin so that the black is of a triangular form. It is also the only species in which there is a black edging before the s. t. line. This series of specimens was separated out as differing obviously from *flava* and was not recognized as Mr. Edwards' species until I compared the types in the American Museum. The distinctive characters are here brought out more clearly.

***Pseudanarta actura*, new species.**

Ground color dull, fuscous brown. Head and thorax concolorous; abdomen more gray, yellowish at base. Primaries very dull and obscurely marked, the only conspicuous feature of the wing being the white blotch above the anal angle. Basal line geminate, obscure, scarcely traceable in most specimens. T. a. line geminate, black, the outer portion broader and more distinct, very oblique and a little excurved. T. p. line geminate, inner line black, outer brown, included space gray, in course squarely exerted over reniform, making a moderate angle on vein 5, whence it runs with a slight incurve to inner margin. S. t. space marked with gray and brown, forming the palest part of the wing and lightening to a white blotch just above the inner margin. S. t. line pale, a little sinuate, more or less obscured, marked by the darker terminal space. A broad, blackish, broken line at base of fringes. The ordinary spots are very obscure, concolorous and faintly defined by a ring of whitish scales. Orbicular oval, oblique. Reniform moderate, kidney-shaped. An obscure blackish bar connects the median lines. Secondaries pale yellowish, with a broad black outer border, the inner edge of which tends to become a little irregular. Beneath, primaries so heavily powdered as to seem almost blackish throughout, yet basally this is over a yellow ground which shows better in the male. On the secondaries there is less powdering, the outer band is broad, and there is a distinct discal dot.

Expands, .80-.96 inch = 20-24 mm.

Habitat. — Deming, New Mexico, September; Wilgus, Cochise County, Arizona.

Two males and four females; all in good or fair condition and all from Dr. Barnes. This is the darkest and most obscurely marked of all the species and also the smallest in average size. A single female measures 24 mm., but this is 2 mm. greater than any other example in the series. It does not seem possible to mistake this for any other species and none were included with any of the older species in my collection.

Perigea latens, new species.

Dull, luteous gray; the females with a reddish tinge; more or less powdery; all the maculation broken. Head and thorax concolorous, patagia tending to a blackish, powdery, sub-marginal line. Primaries with all the maculation traceable and none of it distinct or complete; the darker filled reniform being the most conspicuous feature. Basal line geminate, black, broken, outcurved, extending to the sub-median vein. T. a. line geminate, blackish, broken, only a little outcurved as a whole and between the veins. T. p. line geminate, blackish, tending to become reduced to venular spots below the costal region; rather abruptly bent outwardly and then very even, parallel with outer margin. A fairly defined smoky median shade crosses between the ordinary spots. S. t. line is pale, irregular, more or less emphasized by yellow scales, preceded by a somewhat darker shade and the terminal space variable but tending to paler. There is a narrow, broken, black terminal line followed by a yellow line at the base of the interlined fringes. Claviform wanting or barely indicated in the male; always indicated but never quite complete in the female. Orbicular small, round or nearly so, black ringed, concolorous or slightly paler. Reniform moderate in size, kidney-shaped, dusky. Secondaries whitish, translucent at base, becoming smoky outwardly, the fringes white. Veins and a small discal spot smoky. Beneath gray, powdery, secondaries paler, both wings with an extra-median transverse line and a small discal spot.

Expands, 1.00-1.10 inches = 25-27 mm.

Habitat. — San Diego Co., Calif., V, 28; VI, 10, 21; IX, 16; Yuma Co., Arizona in March.

Three males and three females, all save one ♀ collected by Mr. W. S. Wright for Mr. Frank A. Merrick, the odd female from Arizona collected by Mr. Hutson. As a whole the females are a little broader winged and perhaps a little better marked than the males; but there is little difference. The males have the antennæ very shortly pectinated; in the females they are simple. In general form and habitus this is an ally of *perplexa* Grt.

Caradrina costiplaga, new species.

Ground color a pale creamy luteous — lighter in the flown specimens, more reddish and powdery in fresh examples. Head and thorax concolorous, sides of palpi brown. Primaries with a conspicuous triangular, blackish or brown patch on costa just beyond the middle. Its outer edge reaches the inception of the t. p. line, it extends downward to include the reniform and its inner edge on costa is at just about the middle of that margin. T. a. line single, usually marked by a small costal spot only, sometimes traceable by brown scales in an angulated oblique course across the wing. T. p. line punctiform, evenly outcurved, the dots small, blackish and venular, easily lost in flown specimens. A series of contiguous black terminal lunules basing the dusky fringes. Secondaries dusty gray, with an obscure dark discal lunule and a smoky terminal line. Beneath, primaries very pale luteous with costal patch of upper surface showing through, secondaries white, with faint discal spot.

Expands, .75-.90 inch = 19-22 mm.

Habitat. — Yuma and Yavapai Cos., Arizona in June; Yavapai Co., in August; Baboquivaria Mts., Pima Co., July 15-30; Southern Arizona, Sept. 15-30.

Three males and three females, all more or less flown. Three examples were taken by Mr. Hutson, each at a different time and date; the others are from Mr. O. C. Poling, two of them through Mr. F. A. Merrick. The species is an ally of *conviva* and even smaller and more frail. As it is quite probable that Sir George Hampson will divide the present assemblage in our lists under *Caradrina* no differential characters need be pointed out here.

Homohadena rayata, new species.

Clear ashen gray, more or less shaded with deep brown. Head brown. Collar pale gray with a transverse black line near base. Thorax black powdered, with a broad dark brown band behind the collar. Primaries powdered with blackish or dark brown scales which darken the outer portion; costal area whitish. A longitudinal streak extends from base to the t. p. line and this is broad and diffuse through the basal area, narrowing to a point at the t. p. line. A similar streak extends through the cell from t. a. line outwardly to the outer margin; broadest and diffuse in the median space, narrowing to a point at the margin. All the veins are more or less obviously marked with dark scales. From the outer margin interspaceal black streaks extend inwardly almost to the t. p. line and these are more or less edged with whitish at the point where the s. t. line might be normally expected. No trace of a basal line in the specimens. T. a. line slender, black, continuous, preceded by a whitish line, very oblique and widely outcurved, an inward tooth on sub-median interspace where the longitudinal line crosses, and a slight outcurve below. T. p. line black, slender, continuous, followed by a white line, with a long outcurve over cell and a somewhat more shallow incurve below, a little inward tooth at the point where the longitudinal streak reaches the line. The orbicular is lost in the black streak through cell and the reniform is marked only by a small extension above and below the streak. Secondaries smoky, a little more whitish at base, with white fringes. Beneath whitish, powdery; primaries more smoky on disc, with an indicated transverse line at outer fourth of wing; secondaries powdery along the costa, with discal spot and a very irregular transverse line a little within the outer margin.

Expands, 1.18 inches = 29-30 mm.

Habitat. — Kerrville, Texas.

Two female specimens from Dr. Barnes. The species is allied to *badistriga* but is smaller; the median lines more slender; the interspaceal marks longer and heavier; the secondaries more evenly smoky in the female; without trace of coppery brown shading. It is probable also that the male will be found to have dusky secondaries. As to form this is a slighter insect than *badistriga* and the abdomen of the female is much longer and more obtusely terminated.

Homohadena dinalda, new species.

Dark ashen gray with a slight brownish tinge. Head chocolate brown. Collar brown at extreme base below a black line above which it is very pale gray or whitish. Thorax concolorous or a little gray powdery. Abdomen paler gray. Primaries very little powdery. A prominent, rather well defined black streak extends beneath the median vein from base to t. p. line. A similar streak extends from reniform outward to the s. t. line. Basal line single, black, marked across the costal region only. T. a. line single, black, incomplete, partially lost and very slender in the middle of its course, well marked on the margins, it forms a well defined obtuse outward angle in the cell, a less defined inward angulation on the longitudinal streak and a slight out-curve below this. T. p. line single, black, irregular in thickness, widely outcurved over the cell and deeply incurved in the sub-median interspace, followed by a slightly paler or whitish shading. S. t. line consists of a series of whitish interspaceal blotches which tend to become lost. A series of black terminal lunules. A pale line at the base of the fringes. Orbicular not traceable in the specimens. Reniform very obscurely marked, its form not defined in the material before me. Secondaries smoky, paler at base, with a brown terminal line; fringes more whitish, showing through from beneath is a smoky discal spot and a slightly irregular extra-median line and discal spot; secondaries with a very distinct extra-median line and an obvious discal spot.

Expands, 1.25 inches = 31 mm.

Habitat.—Winnipeg, Manitoba, July 19; Sandy Lake, Newfoundland, August 15.

One male in good condition one female somewhat rubbed and broken. These two examples, widely separated in locality and 10 years in date of capture are, I believe correctly associated, and represent a species allied to *retroversa* and *infixa* in the smoky secondaries and to *badistriga* in the maculation of primaries. It is quite possible that it may be found in collections mixed with *badistriga* which has white secondaries in the male and black streaks in the interspaces toward the outer margin. From *infixa* and *retroversa* it differs in its smaller size and in the almost total loss of its ordinary spots.

Oncocnemis lacticollis, new species.

Ashen gray, powdery. Head and collar creamy, yellowish; palpi gray at sides, head with a black inter-antennal line. Thoracic disc powdery. Abdomen paler gray not powdery. Primaries powdery without transverse lines or ordinary spots; veins black marked; a series of terminal interspaceal black streaks; fringes concolorous. Secondaries yellowish gray at base, darkening to smoky brown outwardly; fringes whitish with a smoky line near base. Beneath, uniform powdery gray, body paler, more yellowish.

Expands, 1 inch = 25 mm.

Habitat. — Stockton, Utah, September 4.

This is a very simply marked form, easily recognizable by the

creamy head and collar, combined with the intensely black line between the antennæ. The type is a female in good condition from Mr. Tom Spalding and is the only example known to me.

Tæniocampa mecrona, new species.

Ground color dull creamy gray with scarcely a trace of red or brown. Head and thorax concolorous, immaculate; abdomen a little more smoky. Primaries with all the maculation obscure, no color contrasts and no well defined lines or spots. Basal line geminate, blackish, broken, traceable in all the specimens. T. a. line well removed from base, rather even, outwardly oblique with a slight outcurve; geminate, but the inner line lost or barely traceable in most examples, while the outer may be broken, a mere scattering of scales, or a rather broad diffuse fascia which is never so dark as to be conspicuous. T. p. line geminate, very evenly outcurved over the cell; less distinctly so below; the outer portion of line punctiform, tending to become lost. S. t. line pale, marked by a slightly darker preceding, powdery shade, very even, almost parallel with the outer margin. A series of small, obscure, interspaceal, terminal marks. Orbicular round, small or moderate in size, concolorous or a little paler, not dark ringed. Reniform very obscure, upright, small, a little constricted centrally, usually traceable by paler scales. Secondaries dull, even, smoky in both sexes. Beneath whitish, more or less powdery; primaries often smoky on disc, sometimes with an extra-median darker line; secondaries paler, powdery along costa, with an extra-median line and discal spot.

Expands, 1-1.15 inches = 25-29 mm.

Habitat. — Kaslo, British Columbia, in early July.

A series of 2 ♂♂ and 6 ♀♀ from Mr. J. W. Cockle who called my attention to the fact that it differed from *T. communis* Dyar, with which it may be confused in collections. Of *communis* I have 14 ♂♂ and 9 ♀♀ before me and, comparing them as grouped, the new species differs obviously in the gray color, lacking all red or brown, while the secondaries are uniformly smoky without yellowish tinge or lustrous appearance. On the whole it is also larger than *communis*, all the females running larger than any male, while in the female *communis* at hand most of the specimens are smaller than the average male and none equal the largest of that sex. A single specimen may not attract attention when mixed with *communis* but, once separated out and compared as series, the differences are obvious.

Leucania calpota, new species.

Ground color brownish ochreous. Palpi brown at sides. Collar with three narrow lines of metallic dark gray. Center of thoracic disc more or less metallic gray, usually marked only on the posterior tuft. These scales are easily lost and are completely present only in fresh examples. The primaries have the usual strigate appearance; the veins a little paler, a darker line each side and a dusky line through the middle of the interspace. There is a dusky shade over and below the median

vein and which extends a little beyond it, tending to connect with a more obscure, triangular, subapical shading. There is a white dot at the end of the median vein. A series of small black interspaceal dots marks the s. t. line. The fringes are dusky and there is a series of terminal black venular points. Secondaries dirty yellowish white, the veins darker and the outer margin dusky. Beneath quite uniform dull pale yellowish; primaries tending to become smoky on disc; secondaries paler, more diaphanous, costal area powdery.

Expands, 1.40-1.52 inches = 35-38 mm.

Habitat. — Harris County, Texas, no date; collector unknown.

Fifteen males and three females mostly in at least fair condition. The species resembles a dusky *phragmatidicola* and was mistaken for it until the mounted series showed that the secondaries were uniformly yellowish rather than white and that the color of primaries throughout was deeper, more like that of *juncicola*, which was sent in with this new form. But the color differences are not the only one separating this species from *phragmatidicola*. In the male the tuftings of legs and abdomen, while of the same type are much less marked and the outer spur of the middle tibia instead of being curved and flattened is very much abbreviated and has a cylindrical short, acute point. The species would belong to the genus *Cirphis* of Hampson.

Stylopoda anxia, new species.

Head, thorax and primaries dull smoky brown, almost black; abdomen and secondaries deeper, more blackish brown, with a bronzed reflection. Maculation of primaries reduced to an obvious s. t. line which is squarely exerted over the cell, white powdered beyond an edging of black scales at that point, deeply incurved below cell and there broader, conspicuously white. In one example a few white scales indicate an upright t. a. line and in two of the examples there is just sufficient difference in shade between the s. t. and terminal spaces, to indicate an irregular s. t. line. The ordinary spots are vaguely indicated by black scales and a slightly paler preceding ring, in one example also by a deepening tint between the spots. Secondaries immaculate. Beneath black with an incomplete median white fascia, which is better marked on the secondaries.

Expands, .67-.72 inch = 17-18 mm.

Habitat. — Fort Wingate, New Mexico, VII, 21, 31; VIII, 3; collector unknown.

Two males and one female, all flown specimen, not in the best of condition; but so characteristic that I have not hesitated to describe.

Parora snowi, new species.

Ground color a rather pale luteous, tending to grayish. Head and thorax uniform in color; abdomen a little paler. Primaries powdered with brown atoms over the entire surface, and more or less with black scales below an oblique line which extends from the end of the median vein to the apex. T. a. line single, brown,

powdery, outwardly bent so as to form almost a right angle at the middle of its course; the angle rounded. Median shade single, brown, well marked, from the middle of costa oblique to the end of the median vein, there acutely bent and inwardly oblique to the middle of inner margin. As the oblique line from apex terminates at the point of angulation, some specimens have an apparently continuous shade line from the apex to the middle of the inner margin. T. p. line single, narrow, brown, outwardly oblique from costa to the point where it reaches the subapical line and then acutely bent and inwardly oblique to the inner margin. S. t. line brown, powdery, rivulous, more or less broken; as a whole parallel to the outer margin. A scalloped terminal line emphasized by blackish terminal venular dots. Ordinary spots often wanting; orbicular, when present, brown, punctiform; reniform small, brown, annular, with concolorous center. Secondaries a somewhat brighter yellowish; sometimes with a median shade line obscurely indicated. Beneath, yellowish; primaries with disc a little smoky.

Expands, .75-.93 inch = 19-23 mm.

Habitat. — Brownsville, Texas, in June.

Five males and four females in fair to good condition. All the males and one of the females came from Prof. F. H. Snow and are dated; three females are from the Esper Ranch, without date, and are out of the collection of the Brooklyn Institute. I have reason to believe that there are other examples in collections.

In the simplest marked of the examples all the lines and the oblique subapical streak are neatly and lightly written in brown, the streak being most obvious and somewhat diffuse inferiorly. The dusky shading tends to increase and in the opposite extreme a blackish brown powdering covers almost the entire area beyond the line drawn from apex to middle of inner margin. All the males are smaller than any of the females.

***Yrias pardalis*, new species.**

Dull smoky dark brown, more or less obviously washed with a blue tinge. Head and collar slightly darker than the rest of the body, else all concolorous. Both pairs of wings are similar in color and the transverse maculation extends over both pairs. T. a. line geminate on primaries, the included space somewhat paler, component parts equally well marked, in course forming a distinct outward tooth at its middle. On secondaries it is more even and single. A median somewhat diffuse but well marked shade crosses before the middle of primaries and at basal third of secondaries. Two other, less obvious, somewhat rivulous dark lines cross the median space before t. p. line, the outer tending to become prominent and black toward inner margin of primaries and across secondaries. T. p. line geminate, the inner portion most prominent and black from costa half way across primaries; then both lines become similar, more diffuse and across secondaries they are well separated. S. t. line more or less diffuse, followed by a reddish shade. A conspicuous black spot at apex just beyond s. t. line, but not quite reaching the tip of wing. A rivulous black

terminal line. A yellow and then a black line on fringes, beyond which they are gray, cut with brown. Beneath uniform smoky brown.

Expands, 1.00-1.16 inches = 25-29 mm.

Habitat. — Santa Rita Mts., Arizona, 5,000-8,000 feet, in June; F. H. Snow.

Two males and two females in good condition from Prof. Snow. The species is allied to *clientis* in the position of the black apical spot; but it is smaller, the vestiture is rough, the maculation much more obvious and diffuse, the s. t. line on secondaries is much more prominent and courses of all the lines differ obviously when compared. The smaller size, rougher vestiture and more conspicuous markings are the easily recognizable features.

EASTERN AND CENTRAL EUPITHECIAS.

RICHARD F. PEARSALL,

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With our *Eupithecias*, especially the eastern forms, there has heretofore been no systematic attempt to separate the species. In an effort to do so my first aim was to gather material in large quantity and to separate it into species, regardless of name. Following this the application of names of described species to some of the forms required long study and patient discrimination, and while some problems remain unsolved, the long series of commoner forms in my own collection serve to establish these names beyond any doubt in my own mind. Even the elusive *miserulata* has been ferreted out by this method. The result leaves a number of forms, which cannot be included under the old names, and some of them are described in this paper; others still remain in abeyance, represented by single examples whose status will not be clear until better specimens are at hand.

***Eupithecia mutata*, new species.**

Expanse 19 mm. Palpi long, rather heavy, dark brownish, tipped with white. Antennæ in ♂ flattened, strongly ciliate, in ♀ flattened, almost simple. Head and thorax dark brownish gray. Wings whitish leaden, shaded with dark gray or dark brown and rust-red scales, the latter forming a band across fore wings, within basal area, which is frequently wanting or replaced by a leaden gray band, and another, always present with more or less distinctness just outside extradiscal geminate pale line. Basal line fine, of black scales, near to origin of wing, turning sharply outward at